

matter best left to the contracting parties or, if necessary, to the judiciary on a case-by-case basis, and certainly should not be done through a rulemaking of general applicability.

**E. Adoption of CTN's Newest Proposals To Address The Isolated Risk Of Downconverter Overload Would Unnecessarily Hamper The Commercial Viability Of Two-Way Services.**

In their Comments in response to the *NPRM*, the Petitioners provided the Commission with a detailed analysis establishing three very fundamental points: (1) so-called "brute force" interference to ITFS receive sites from response stations is extremely unlikely (and is virtually impossible to occur when all of the outbound transmitters in a market are collocated at a common site that also serves as the response station hub, as will most often be the case); (2) there are a vast array of techniques that can be employed prior to activation of response stations both to identify those rare cases where activation of a response station might cause an ITFS block downconverter ("BDC") to overload, and then to mitigate any potential for interference; and (3) in those rare cases where BDC overload does occur, additional techniques are available to cure the resulting interference (including cessation of operation of the offending response station). Thus, the Petitioners demonstrated that adoption of CTN's November 25, 1997 proposal to "refarm" the E, F and G Group channels, to restrict commercial response stations to MDS Channels 1 and 2/2A and the refarmed G and H Group channels, to limit ITFS return paths to the existing 125 kHz channels, and to mandate a 24 MHz guardband between any response channel and any channel used for downstream transmissions would be unnecessarily restrictive.<sup>107/</sup>

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<sup>107/</sup> See Petitioners Comments, at 71-104.

The Petitioners were hardly alone in opposing CTN's approach. Indeed, while CTN would limit ITFS licensees to just the existing 125 kHz channels for return paths, every other representative of the ITFS community commenting on the issue has called upon the Commission to permit the use of the 6 MHz ITFS channels for advanced technologies. The DL&A ITFS Parties, for example, cogently stated that:

the [proposed] rules must permit all licensees -- including ITFS licensees acting on their own -- to take advantage of digital technology advances and flexible system designs. Although many of the engineering techniques that would be available under the rules are most often going to be implemented by ITFS licensees in the context of an excess capacity agreement with a wireless cable operator, some ITFS licensees will have both the capability and need to so on their own. This is likely to be particularly true with ITFS operators in three circumstances -- those that wish to enhance interactivity of their telecommunicated instruction by audio, video and data return links instead of audio-only return links now possible over ITFS response channels and telephone return links; those that seek to offer high speed Internet access services to their schools and other receive sites over ITFS frequencies; and those that seek to fill in coverage gaps in their systems using boosters or beambenders. The rules proposed appear to be consistent with this principle.<sup>108/</sup>

HITN noted that "many ITFS licensees will have access to funding under the USF program to construct technologically advanced two-way systems capable of handling their voice, video, Internet and data needs."<sup>109/</sup> Region IV Educational Service Center, *et al.* sounded a similar theme, noting that "[u]nless the Commission affords the ITFS licensees the needed flexibility to fully exploit digital technology and in delivering two-way communications services, neither the instructional nor commercial benefits of the new technologies will be fully recognized."<sup>110/</sup> On behalf of its ITFS

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<sup>108/</sup> See DL&A ITFS Comments, at 4.

<sup>109/</sup> HITN Comments, at 5.

<sup>110/</sup> P&C ITFS Comments, at 2.

clients, Schwartz, Woods and Miller emphasized that "the application of two-way interactivity will enhance the effectiveness of ITFS services and will assist ITFS licensees to gain broader acceptance for ITFS as an effective distance learning delivery system. Indeed, ITFS licensees should be able to employ all new technologies that are developed for use in MDS, including two-way communications and Internet access."<sup>111/</sup> Corporation for Public Broadcasting, *et al.* and Public Television 19, Inc. provided that Commission with a description of how the needs of the ITFS community needs could be met by providing ITFS licensees with improved access to return paths over and above the 125 kHz channels presently available.<sup>112/</sup> And, NIA emphasized the importance of affording ITFS licensees the ability to deploy advanced technologies on their own spectrum -- something that would have been impossible under CTN's approach.<sup>113/</sup>

Moreover, the ITFS community has agreed with the Petitioners that CTN's approach is unnecessarily restrictive from a technical perspective. Again, the DL&A ITFS Parties have said it well:

Competent engineers associated with the ITFS Parties have considered these issues and have concluded that the interference assumptions and calculations underlying the proposed rules are conservative and should provide sufficient interference protection. They believe that incidents of brute force overload, if they happen, will be isolated and can be cured with appropriate technical solutions. Moreover, CTN's proposed "refarming" solution creates a host of problems. . . . The ITFS Parties believe that this "cure" would be much worse than the purported "disease." Rather than force an unnecessary and spectrally inefficient solution that may adversely affect ITFS licensees on each of the ITFS channel groups and may result in the permanent replacement of good ITFS channels with bad ones, the FCC, as well as CTN, should

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<sup>111/</sup> SW&M ITFS Comments, at 5.

<sup>112/</sup> See Public Television 19 Comments, at 3-5; CPB Comments, at 8-9.

<sup>113/</sup> See NIA Comments.

focus more simply on crafting rules that require the proponent of a two-way, cellularized system to resolve interference problems caused by the system, and to shut down any interfering operations until a resolution can be achieved. The risk of inappropriate system design, engineering errors, defective or careless facility construction and even unforeseen or anomalous problems should be on the operator of the two-way system. This will provide adequate incentives for operators to avoid interference.<sup>114/</sup>

The San Francisco/San Jose Consortium, which includes a CTN member (the Roman Catholic Communications Corporation), along with the Regents of the University of California, the Association for Continuing Education, Peralta Community College District, the Santa Clara County Board of Education and San Jose State University took a similarly dim view of the CTN approach:

Full flexibility is key to designing two-way systems which make efficient use of spectrum and are properly tailored to local needs and conditions. Accordingly, the Consortium opposes the proposals discussed in the *NPRM* which would dedicate specific channels to upstream or downstream use. . . . The Consortium likewise believes that the rechannelization proposal advocated by [CTN] may not be appropriate for the San Francisco-San Jose market. . . . [T]he potential for designing a two-way system and associated interference concerns depend on the existing configuration of stations, which varies greatly among markets. The Commission would hamper development of spectrum efficient uses if it mandated a "one-size-fits-all" approach to two-way system design. ITFS and MDS licensees in San Francisco/San Jose and [their lessee] should have full flexibility to negotiate among themselves to channel swap, rechannelize, address any interference concerns and program shift on a voluntary basis as appropriate in their specific market. Interference issues such as "brute force overload" will be corrected typically by the operator, as in the past on a case-by-case basis, through the use of filters, traps and beam benders.<sup>115/</sup>

Seeming oblivious to the adverse impact of its approach on ITFS licensees who are anxious to take advantage of advanced technologies, and certainly ignoring the adverse impact on spectral

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<sup>114/</sup> DL&A ITFS Comments, at 6-7.

<sup>115/</sup> San Francisco/San Jose Consortium Comments, at 14-15.

efficiency if 24 MHz of spectrum must sit idle,<sup>116/</sup> CTN's comments in response to the *NPRM* again advance its initial refarming and 24 MHz guardband proposal as so-called "Plan A." However, perhaps recognizing that its initial proposal would meet with the displeasure of the ITFS community (not to mention the Petitioners), CTN now advances a so-called "Plan B" which calls for the adoption of onerous restrictions on the installation of response stations, coupled with restricting return paths to MDS Channels 1, 2/2A, E2-E4 and F1-F3 and mandating a 6 MHz guardband between any return path and any ITFS channel.<sup>117/</sup> While the Petitioners will refrain from addressing Plan A once again, they must make clear that Plan B is similarly overly restrictive and spectrally inefficient.

At the outset, by restricting return paths to MDS Channels 1, 2/2A, E2-E4 and F1-F3, CTN's Plan B would provide 6 MHz less for return paths than even CTN would have made available under Plan A. As the Petitioners noted in their Comments in response to the *NPRM*, Plan A is fundamentally flawed by its artificial limit on the amount of spectrum that can be employed for return paths, a limit that may become particularly troublesome where not all of the particular

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<sup>116/</sup> The Petitioners must admit to some confusion over CTN's suggestion (albeit buried in its Engineering Exhibit) that "MDS operators could still use the 24 MHz of guardband spectrum for conventional downstream MDS operations." CTN Comments, Engineering Exhibit, at ¶ 11. If CTN truly believes a 24 MHz guardband is necessary in order to protect ITFS reception from downconverter overload, why is the same 24 MHz guardband not also necessary to protect MDS reception? Given that MDS and ITFS receive sites generally are equipped with similar downconverters, logic dictates that receive sites in the two services should be equally vulnerable. CTN's misguided contention that a 24 MHz guardband is necessary to protect ITFS reception, but not MDS reception, calls into question the technical underpinnings of CTN's entire argument.

<sup>117/</sup> See CTN Comments, at 17-18.

channels on which return paths are permitted are available to the wireless cable operator.<sup>118/</sup> Plan B is similarly flawed -- it assumes that the few channels on which return paths would be permitted both are leased by the wireless cable operator and can be “turned around” consistent with cochannel and adjacent channel obligations. Where those two conditions cannot be satisfied, far fewer channels may actually be available for return paths -- perhaps not enough to establish a viable commercial business absent the flexibility to use other channels for return path operations.<sup>119/</sup>

Moreover, and more importantly for those ITFS licensees among the Petitioners, Plan B suffers the same fundamental defect as CTN’s prior proposals, *i.e.*, it totally ignores the significant demand within the ITFS community for the ability to utilize ITFS channels for return path operations!<sup>120/</sup> CTN fundamentally misconceives the objective of this proceeding when it states that “the intent of this rule making [is] to enhance the ability of MDS operators to offer new and innovative services . . . .”<sup>121/</sup> To the contrary, as the Petition stated with crystalline clarity, “[t]he proposed rules . . . have been carefully crafted to provide all ITFS licensees -- whether or not they lease excess capacity for wireless cable operations -- to take advantage of the potential that digital

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<sup>118/</sup> See Petitioners Comments, at 103.

<sup>119/</sup> The Petitioners’ view in this regard is shared by ITF, which has noted with regard to CTN’s initial proposal that “the optimum ratio of upstream and downstream capacity will differ from market to market or will change over time. Further, even if it is deemed essential to segregate upstream transmissions on one end of the ITFS spectrum, it may be preferable under certain circumstances to devote the A and B channels to this purpose rather than the G and H channels.” ITF Comments, at 31.

<sup>120/</sup> See Petitioners Comments, at 101-102.

<sup>121/</sup> CTN Comments, Engineering Exhibit, at ¶ 13.

technology offers . . . .”<sup>122/</sup> The *NPRM* tentatively rejected a proposal to restrict return paths to MDS Channels 1 and 2/2A because “it would . . . unnecessarily prevent ITFS licensees from using their own channels for return paths.”<sup>123/</sup> And, as the comments filed by the Petitioners and others in response to the *NPRM* demonstrate, that decision was a correct one, for there is significant demand among the educational community to use ITFS channels for return paths.<sup>124/</sup> The Commission cannot ignore the substantial record before it which establishes that ITFS licensees are clamoring for access to additional return path capabilities. The NIA/WCA Joint Proposal said it best: “ITFS licensees should have opportunities equal to those afforded MDS licensees to implement advanced technologies utilizing their spectrum.”<sup>125/</sup>

As the Commission contemplates CTN’s call for banning return path use on any ITFS channel or any channel within 6 MHz of an ITFS channel, the Commission should be cognizant that CTN has provided the Commission with absolutely no technical analysis which even purports to show that the operation of response stations within 6 MHz of an ITFS channel will invariably lead to interference. Nowhere in its filing has CTN even addressed whether interference can be avoided where a response station operates on a channel adjacent to an outbound ITFS station, much less demonstrate that the only mechanism for avoiding interference is the use of a spectrally inefficient guardband. To the contrary, CTN implicitly concedes that adjacent channel operations are possible,

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<sup>122/</sup> Petition, at 18.

<sup>123/</sup> *NPRM*, at ¶ 13.

<sup>124/</sup> See Petitioners Comments, at 101-102; San Francisco/San Jose Consortium Comments, at 14-15; DL&A Comments, at 4; HITN Comments, at 5; P&C ITFS Comments, at 2; SW&M ITFS Comments, at 5; Public Television 19 Comments, at 3-5; CPB Comments, at 8-9; NIA Comments.

<sup>125/</sup> NIA/WCA Joint Proposal, at ¶ IX.

but that the use of a 6 MHz guardband “would mean that no ITFS co-channel or ITFS adjacent-channel Response Station operators would occur thereby eliminating the need for complex new (and controversial) interference calculation algorithms.”<sup>126/</sup> *In other words, CTN would have the Commission sacrifice the ability of ITFS licensees to deploy their spectrum flexibly merely to avoid the need for the development of interference protection rules!*

In response to CTN, it cannot be emphasized enough that:

[g]uard bands are spectrally inefficient and, as a rule, are used only when coordination is impractical. A more efficient and far more common approach to prevent mutual interference is to isolate users by a combination of factors including frequency, distance, power and antenna height. In any particular case there are usually several choices, limited, of course, by cost, equipment characteristics, and the nature of the service. This approach has been used for years in all of the radio services regulated by the Commission . . .<sup>127/</sup>

What CTN is proposing cannot be squared with the policy of mandating guardbands as a last resort only if other techniques for avoiding interference fail.

CTN also suggests that the Commission should ban response station hubs from ITFS channels or any channel within 6 MHz of an ITFS channel merely so that no ITFS licensee will have to protect a response station hub from interference should that ITFS licensee elect in the future to modify its ITFS facilities.<sup>128/</sup> What CTN denigrates as a “preclusive effect,” however, is nothing more than an application of the Commission’s tried and true approach to interference management. Obviously, every time the Commission authorizes a new facility on an ITFS channel or a channel

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<sup>126/</sup> CTN Comments, Engineering Exhibit, at ¶ 15.

<sup>127/</sup> *Broadcast Corporation of Georgia (WVEU-TV)*, 96 F.C.C.2d 901, 908 (1984)

<sup>128/</sup> See CTN Comments, at 16, 18.

adjacent to an ITFS channel, it will have a “preclusive effect” on the ability of neighboring ITFS licensees to make modifications in the future. That is true whether the new facility is a traditional downstream facility, or employs advanced technologies. Despite the fact that every facility it authorizes may in some way preclude a neighbor from making some modification sometime in the future, the Commission has consistently employed a “first come, first served” approach to ITFS licensing, and has never precluded one new or modified facility in order to allow another licensee to maintain the flexibility to implement an as-yet unproposed modification in the future. Admittedly, every response station hub that the Commission authorizes will have to be protected when a neighbor proposes modifications to its own facilities in the future. The Commission’s objective should be to assure that the response hub is not entitled to excessive protection that would unduly limit neighbors’ flexibility. In this regard, and in recognition that their initial approach to protection of response station hubs was quite conservative, the Petitioners suggested in their initial Comments a revised approach to protecting response station hubs that eliminates any concern that the initial approach to the hub protection was too conservative.<sup>129/</sup>

Moreover, the restrictions that CTN proposes upon the installation of response stations under Plan B as the *quid pro quo* for reducing the guardband from 24 MHz to 6 MHz are both unnecessary and so onerous that they would threaten the commercial viability of two-way service offerings. As the Petitioners stressed in their initial Comments in response to the *NPRM*, the rules adopted in this proceeding must afford the wireless cable operator the ability to respond rapidly and flexibly to

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<sup>129/</sup> See Petitioners Comments, at 65-71.

marketplace demand for innovative two-way services, for if wireless cable cannot so respond, there are a wide array of other wireless competitors who will.<sup>130/</sup>

While certain of the specific restrictions on response stations advanced by CTN are either already provided for<sup>131/</sup> or already have been addressed,<sup>132/</sup> the adoption of others could seriously undermine the competitive viability of commercial two-way services. Most significantly, the Petitioners believe that adoption of CTN's proposed rules calling for extensive coordination and testing of response stations prior to activation of service would effectively preclude the development of a viable commercial service in the 2.5 GHz band.<sup>133/</sup>

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<sup>130/</sup> See *id.* at 5.

<sup>131/</sup> For example, CTN advocates that the Commission require response station transmitters to be fixed. See CTN Comments, at 13. This is a classic "red herring." What CTN does not discuss is that the Petition itself was captioned "Amendment of Parts 21 and 74 To Enhance The Ability of [MDS] and [ITFS] Licensees To Engage In *Fixed* Two-Way Transmission" (emphasis added) and that the proposed definitions of "Multipoint distribution service response station" and "ITFS response station" contained in proposed Sections 21.2 and 74.901, respectively, both mandate that response stations be "fixed stations." See Petition, at Appendix B, at 1, 35.

<sup>132/</sup> The appropriate maximum power level for response stations was addressed in detail by the Petitioners in their Comments in response to the *NPRM* and CTN has provided no new information that requires further discussion. See Petitioners Comments, at 55-57.

<sup>133/</sup> In addition, banning customer-installed equipment as proposed by CTN could have a significant adverse impact on commercial viability. Already, DirecTV is providing a high-speed Internet access service utilizing a specialized antenna that a consumer can purchase from retail outlets and install. It is anticipated that other service providers will also be moving towards the direct sale of equipment to consumers. CTN never explains why wireless cable operators should be required to bypass retail channels for the distribution of its equipment. While CTN may be concerned about response stations transmitting in an inappropriate direction, that will not occur. The proposed rules mandate that a response station can only operate when engaged in communications with its associated hub. See Petition, Exhibit B at 22, 54 (proposed Sections 21.909(m), and 74.939(l)). In order for a two-way communications network to operate, response stations will have to be authorized by the response station hub before they can transmit. In order to receive that authorization, the response station will have to be aligned with the hub.

Misapplying information provided to CTN by the Petitioners in a good faith effort to educate CTN as to how rarely BDC overload will even be a consideration, CTN would now have the Commission ban the installation of any response station unless: (1) the licensee of the hub provided advance notice of such installation to the licensee of any ITFS receive site located within 1,960 feet of the response station; (2) with respect to any response station to be located within a so-called "Equipment Test Zone" in front of each ITFS receive site, the response station hub licensee provided at least 30 days advance notice of its desire to conduct tests of blanketing interference; and (3) tests are conducted at the ITFS receive site with all response stations in the zone activated or conducted at 6 dB in excess of the power proposed for the response station, and those tests show that no blanketing interference results.<sup>134/</sup>

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<sup>134/</sup> While the Petitioners submit that the testing program advocated by CTN should be rejected in full because it has the effect of unduly precluding the installation of response stations, the Commission should also note that the particular test program advanced by CTN is ill-conceived. CTN provides no meaningful reason why either all of the response stations within the test zone should be required to be operating during the test or there must be a 6 dB increase in power in the tested response station. As the Petitioners have discussed previously, the number of response stations of a given class that can operate simultaneously within a given region will be established as a condition on the hub authorization and controlled by the network. Moreover, a number of systems are likely to deploy TDMA or similar control protocols under which only one response station will be permitted to use a given frequency within a given sector at any particular moment in time. In other words, it will often be the case that because of license conditions or the control protocol employed, far fewer than all response stations within the so-called Equipment Test Zone will be activated simultaneously. Under such circumstances, to require a test where all of the response stations within a zone must transmit simultaneously when such will not occur in the "real world" would be to effectively preclude the installation of response stations that could otherwise operate.

CTN's alternative suggestion that testing be performed with a 6 dB increase in power in order to simulate multiple response stations transmitting simultaneously is equally flawed. CTN provides no explanation whatsoever as to why such a power increase should be required for testing purposes, and none is apparent to the Petitioners. The use of a 6 dB increase approximates the power of four response stations operating simultaneously within the equipment test zone. It is extremely unlikely

The most significant defect in CTN's approach is that consumers will not accept a delay of 30 days or more before the commencement of service. As the Petitioners stressed in their comments in response to the *NPRM*, given the wide variety of service providers from whom consumers can choose, the rules applicable to the MDS and ITFS must allow rapid deployment of two-way offerings. Thus, as a practical matter, adoption of the CTN proposal would preclude the installation of response stations within the so-called Equipment Test Zone as certainly as if such installations were banned outright.

The substantial impediment that would result from adoption of CTN's proposal must be weighed against the fact that CTN's restrictions are totally unnecessary in order to avoid the risk of BDC overload. The definition of the Equipment Test Zone proposed by CTN is based upon the analysis conducted by the Petitioners and reported in their Comments in response to the *NPRM*. As the Petitioners discussed, *if one assumes* (i) that the BDC has an overload point of -28 dBm, (ii) that the FCC standard receive antenna specified in Section 21.902(f)(3) of the Rules is used at both the ITFS receive site and the response station, (iii) that the response station is using the same polarization as the ITFS receive site, (iv) that the response station antenna is oriented directly at the ITFS receive site, and (v) that the transceiver is operating at +48 dBm, *then* the mitigation techniques discussed in the Comments *may* have to be employed if the transceiver is installed within the area

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that four transmitters in such a small area would transmit simultaneously and, of course, such simultaneous operation will be impossible where precluded by license conditions or the use of a time division control protocol. Thus, once again, it appears that CTN is proposing restrictions that would unduly prevent the installation of response stations. Absent any better explanation by CTN of why a 6 dB increase would avoid undue preclusion of response stations, the Commission should not consider adopting such a requirement.

CTN now calls the Equipment Test Zone.<sup>135/</sup> In other words, the Petitioners' analysis assumed extremely adverse conditions that do not reflect the conditions that will exist at the overwhelming majority of actual installations. That CTN's approach would unnecessarily preclude response service under "real world" conditions can be readily illustrated by a few examples.

1. Assume that the wireless cable operator proposes to install a response station 1,000 feet in front of the ITFS receive site, with the response station pointed directly away from the ITFS BDC (*i.e.*, pointed directly towards the ITFS transmitter). This will be a common scenario, since in most markets all ITFS and MDS stations are collocated at a common site that will serve as the response station hub. Although the response station is located within CTN's proposed Equipment Test Zone, there is absolutely no chance for BDC overload because the response station will be transmitting away from the ITFS receive site. In other words, despite the fact that BDC interference cannot occur under this scenario, CTN would nonetheless require a 30 day delay and extensive testing, effectively precluding service to potential customers. As this example illustrates, and the Petitioners discussed in detail in their Comments, the area where ITFS BDCs are at risk shrinks rapidly when the transceiver and ITFS receive antenna are not directly aligned.<sup>136/</sup> Yet, CTN's proposal does not incorporate the fact that the angle of the transceiver towards the ITFS receive site will be known.

2. Assume that the wireless cable operator proposes to install a response station 1,000 feet directly in front of an ITFS receive site where the installed BDC has an overload point of -22 dBm,

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<sup>135/</sup> See Petitioners Comments, at 74-75.

<sup>136/</sup> See Petitioners Comments, at 73-77. Moreover, as response station hubs are located so that any given receive site will have the ability to "see" more than one hub site, the size and shape of the area where BDC overload is even a consideration will depend directly upon which response station hub a given response station is associated with.

6 dB better than that described by CTN. As the Petitioners established in their Comments, the dynamic range of the BDC at the ITFS receive site is a significant factor in determining the size of the area where installation of a response station could pose a threat of BDC overload.<sup>137/</sup> The analysis that CTN used to specify the size of the Equipment Test Zone assumed that the ITFS receive site employed a California Amplifier Model 130001 BDC. While that was an appropriate assumption for purposes of a general analysis, that assumption should not be carried forward in “real world” scenarios where the dynamic range of the BDC may be significantly superior. Some BDCs older than the model on which CTN has based its work are filtered units that have significantly greater resistance to brute force overload. Moreover, newer downconverters can have better signal handling capabilities than the specified model and, as the Petitioners Comments illustrate, further improvements are certainly possible. If an ITFS receive site has already installed a BDC with dynamic range performance superior to the California Amplifier Model 130001, adoption of the CTN proposal with its attendant delays in the ability of the wireless cable operator to serve subscribers could unnecessarily preclude the deployment of two-way service within the Equipment Test Zone. Under the assumption set forth above, CTN would require the unduly onerous 30 day testing program for a receive site located 1,000 feet from the ITFS receive site regardless of the BDC installed at the receive site. However, even assuming that all other elements remain as assumed by CTN (*i.e.*, the transceiver is co-polarized, pointed directly at the ITFS receiver and operating at 48 dBm, no BDC overload will occur if the overload point is -22 dBm, a not uncommon figure for

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<sup>137/</sup> See *id.*, at 98.

today's downconverters. Thus, it is patently obvious that under this scenario, CTN would subject the wireless cable operator to an unnecessary delay.

3. Assume that the wireless cable operator proposes to install a response station even as close as 200 feet directly in front of an ITFS receive site, where the response station will operate on the opposite polarization of the ITFS system and pointedly directly at the ITFS receive site. As the Petitioners established in their Comments, polarization is a significant factor in determining the size of the area where installation of a response station could pose a threat of BDC overload.<sup>138/</sup> The analysis that CTN has employed in determining the size of the Equipment Test Zone assumed that the ITFS system and the response station would operate utilizing the same polarization. While that was an appropriate assumption for purposes of a general analysis, there is no valid reason for carrying forward that assumption when addressing "real world" scenarios where the polarizations will be known. Under the assumption set forth above, even assuming that all other elements are as assumed by CTN (*i.e.*, the transceiver is pointed directly at the ITFS receiver and operating at its 48 dBm, no BDC overload will occur because of the presence of cross-polarization discrimination. Once again, CTN's proposal would subject the wireless cable operator to an unnecessary 30 day or more delay for testing when the cross-polarization alone makes it obvious that no testing is necessary.

As these examples illustrate, it is impossible to establish an inflexible zone around each ITFS receive site that reflects the area in which a response station installation threatens to result in BDC overload. There are a host of variables, including orientation and polarization of the antennas

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<sup>138/</sup> See Petitioners Comments, at 94.

relative to each other, distance between the antennas, sidelobe suppression of the antennas, BDC dynamic range and response station power, that all determine whether or not BDC needs to even be considered. To establish a zone where, as a practical matter, no response stations will be installed, based on worst case assumptions with respect to these variables is unduly preclusive.

The DL&A Parties has joined with the Petitioners in emphasizing that requiring the prompt cure of any interference (by ceasing operation of the offending transceiver, if necessary) provides adequate protection since wireless cable operators will be loathe to install response stations at subscriber locations unless they are certain that those response stations can continue to operate.<sup>139/</sup> Indeed, not long ago counsel for CTN argued to the Commission that once a wireless cable operator establishes an awareness of the location and design of neighboring ITFS facilities, the Commission can rely on the wireless cable operator to protect those facilities from interference without any need for notifying neighbors or securing Commission review of the operator's specific proposed facilities prior to construction and operation.<sup>140/</sup> Counsel correctly noted at that time that "[t]he economic disincentive of building facilities which do not meet the specifications in the rules or a negotiated

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<sup>139/</sup> See DL&A ITFS Comments, at 7.

<sup>140/</sup> Representing Bell Atlantic Corp. and NYNEX Corp., counsel for CTN argued vigorously that MDS BTA authorization holders should be permitted to construct new MDS stations without having to apply to the Commission and receive specific authorizations for each facility. Rather, they proposed (1) that the authorization holder merely be required to submit a document identifying all existing facilities within the BTA entitled to interference protection; and (2) that once a public comment period had passed and it was agreed that the document was accurate, BTA authorization holders could then construct new facilities without prior authorization. See BA Petition, at 5-10; Joint Reply of Bell Atlantic Corp. and NYNEX Corp., MM Docket No. 94-131, at 2-5 (filed Sept. 27, 1995)[hereinafter cited as "BA/NYNEX Reply"].

agreement should be sufficient to allow construction without formally licensing each site.<sup>141/</sup> While the Petitioners are proposing a much more conservative approach than counsel previously proposed,<sup>142/</sup> counsel was clearly correct that there needs to be “a break from the past in which little progress has been made in developing wireless cable.”<sup>143/</sup>

Finally, the Petitioners find it ironic that CTN relies so heavily on the various filings submitted by WCA in connection with the WCS proceeding in support of its position on downconverter overload.<sup>144/</sup> A comparison of the rules adopted by the Commission in the WCS proceeding with the proposals advanced by the Petitioners here demonstrates that the Petitioners are advocating a system that is much more protective of ITFS receive sites than the WCS precedent would require.<sup>145/</sup>

Unfortunately, in an effort to advance its position, CTN distorts the record in the WCS proceeding (a proceeding in which CTN played no role). Most significantly, CTN erroneously contends that “[i]n a Memorandum Opinion on [sic, should be “and”] Order released on April 2,

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<sup>141/</sup> BA Petition, at 6-7.

<sup>142/</sup> Unlike the prior proposal, which provided for no application proposing specific facilities and no opportunity for the filing of a petition to deny, under the Petitioners’ proposal: (i) an application proposing specific facilities and demonstrating that those facilities would not cause interference would have to be filed with the Commission and served on neighboring licensees; (ii) the Commission would give public notice of each specific proposal; and (iii) neighboring licensees would have 60 days to petition to deny any specific proposal before service could commence. These features have been proposed by the Petitioners to avoid the very problems that WCA and others noted with the BA Petition.

<sup>143/</sup> BA/NYNEX Reply, at 5.

<sup>144/</sup> See CTN Comments, at 9-10.

<sup>145/</sup> See Petitioners Comments, at 91.

1997, the Commission accepted the WCA's arguments [regarding the potential for WCS interference to MDS and ITFS] and imposed the requested 20 watt power cap."<sup>146/</sup> In fact, however, the Commission did not limit fixed WCS operations to 20 watts, and instead permits fixed WCS facilities to operate at up to 2,000 watts EIRP (*i.e.* the same maximum EIRP that the Petitioners propose here).<sup>147/</sup>

To appreciate how protective the Petitioners' approach is, it is appropriate to examine the rules adopted by the Commission with respect to the potential for BDC overload by WCS. Section 27.58 of the Commission's Rules governs WCS protection of ITFS and MDS operations, and provides in pertinent part that:

(a) WCS licensees shall bear full financial obligation to remedy interference to MDS/ITFS block downconverters if all of the following conditions are met:

- (1) The complaint is received by the WCS licensee prior to February 20, 2002;
- (2) The MDS/ITFS downconverter was installed prior to August 20, 1998;
- (3) The WCS fixed or land station transmits at 50 or more watts peak EIRP;
- (4) The MDS/ITFS downconverter is located within a WCS transmitter's free space power flux density contour of -34 dBW/m<sup>2</sup>; and
- (5) The MDS/ITFS customer or licensee has informed the WCS licensee of the interference within one year from the initial operation of the WCS transmitter or within one year from any subsequent power increase at the WCS station.

\* \* \*

(e) At least 30 days prior to commencing operations from any new WCS transmission site or with increased power from any existing WCS transmission site, a WCS licensee shall notify all MDS/ITFS licensees in or through whose licensed service areas they intend to operate of the technical parameters of the WCS transmission facility. WCS and

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<sup>146/</sup> See CTN Comments, at 10.

<sup>147/</sup> See *Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service*, 12 FCC Rcd 3977, 3983 (1997). While mobile WCS units are limited to 20 watts, that limitation is of no moment here since the Petitioners are not proposing that response stations be mobile. See *supra* note 131.

MDS/ITFS licensees are expected to coordinate voluntarily and in good faith to avoid interference problems and to allow the greatest operational flexibility in each other's operations.<sup>148/</sup>

By comparison, the rules proposed by the Petitioners are far more protective of ITFS.

- Unlike the WCS rules that sunset in four years, the Petitioners have proposed that the licensee of the response hub authorization be required to cure interference from response stations no matter when it occurs. Thus, while ITFS licensees must expend moneys to protect themselves against WCS interference occurring after February 20, 2002, ITFS licensees are assured that BDC overload will be cured at no cost no matter when it occurs.<sup>149/</sup>
- Unlike the WCS rules that only apply if the interfering station transmits at 50 watts or more EIRP, the Petitioners have proposed rules that require the licensee of the response hub authorization to cure interference caused by a response station, regardless of the maximum power of that response station.
- Unlike the WCS rule, which only applies to ITFS downconverters installed prior to August 20, 1998, the Petitioners have proposed to cure interference caused by BDC overload at any registered ITFS receive site installed prior to activation of the offending transceiver.<sup>150/</sup>
- Unlike the WCS rule, which only requires the licensee to cure interference to ITFS receive sites located within a certain power flux density contour, the rules proposed

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<sup>148/</sup> 47 C.F.R. § 27.58(a), (e).

<sup>149/</sup> While CTN contends here that “a post hoc interference resolution process remains inconsistent with the nature of ITFS,” that is precisely the process that the Commission has adopted in protecting ITFS stations from WCS interference. CTN Comments, at 12. *Significantly, neither CTN nor any other ITFS representative has sought reconsideration of that approach.*

<sup>150/</sup> See Petitioners Comments, at 91. This approach should address the concerns expressed by Maryland regarding notice to non-adjacent channel licensees of proposed hubs. See Maryland Comments, at 13. The Petitioners Comments inadvertently suggest at one point that protection should be limited to those ITFS receive sites registered prior to the filing of the application for the response station hub. See *id.* That does not accurately reflect the Petitioners’ view, which is that an ITFS receive site should be entitled to protection even if registered after the application for the response station hub is filed, so long as the ITFS receive site is actually installed prior to the activation of the offending transceiver.

by the Petitioners require that BDC overload interference be cured no matter where the offending transceiver is located in relationship to the ITFS receiver.

- Unlike the WCS rule, under which interference must be cured only if the complaint is made within one year of the activation of the offending transmitter, the rules the Petitioners have proposed allow an ITFS licensee to insist upon a cure of interference no matter how long after the offending transceiver was activated.
- Unlike the WCS rule, which only affords an ITFS licensee 30 days advance notice of the activation of WCS operations, the Petitioners are proposing a minimum of 60 days between Commission public notice of the proposed response station hub and activation of the hub. Moreover, the Petitioners have indicated that they would not object were the Commission to require that the licensee of a response hub licensed to operate in the 2.5 GHz band notify all MDS and ITFS licensees with a PSA overlapping the response service area of the hub in any part and any ITFS licensee serving a ITFS registered receive site within the response service area of the hub at least 30 days prior to commencing operation of the response hub.<sup>151/</sup>

Thus, the WCS proceeding provides a valuable illustration of how the Commission has chosen to handle the problems caused by the ITFS community's use of downconverters that do not adequately filter transmissions on channels other than those intended to be received. While WCA may not agree with all of the rules adopted by the Commission in that proceeding, CTN has certainly advanced no cogent argument why the Commission should impose more burdensome BDC protection requirements here than it did in WCS.

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<sup>151/</sup> See Petitioners Comments, at 104-105 (noting that "the 30-day notice period is identical to the notice that a WCS licensee must give to MDS and ITFS licensees that might suffer BDC overload from the commencement of WCS operations. See *WCS Reconsideration Order*, 12 FCC Rcd at 3985.").

**F. While Modifications To The Methodology Proposed In The *NPRM* For Calculating The Interference Potential Of Response Stations Are Appropriate, The Commission Must Assure That All Interference Analyses Are Conducted Utilizing A Common Approach.**

*1. The Petitioners Have Addressed Many Of The Concerns Raised Regarding The Methodology Through Minor Revisions.*

In an effort to address concerns that the Petitioners and others have identified regarding the methodology proposed in the Petition for predicting harmful electrical interference from response stations, the Petitioners are submitting as Exhibit 1 hereto a revised proposed methodology. This revised version modifies the prior version as follows:

- The separation of grid points is now specified in terms of integer seconds of latitude and longitude rather than in miles. This makes it easier to specify and calculate the locations of the grid points, as well as to check for a sufficient number of grid points.<sup>152/</sup>
- The determination of whether a sufficient number of grid points have been specified is qualified by two additional tests. First, the spacing of grid points must be such that no smaller spacing (larger number) of the grid points will result in the 3 dB criterion not being met. Because the function used to calculate the number of grid points is not monotonic, this eliminates an alias in the function used to determine the number of grid points. Second, when sectorized antennas are used, the number of grid points must be such that a minimum number of points fall within each sector. The minimum number per sector varies with the length of the sector from the hub. This assures adequate representation of each sector in the statistical distribution of response stations for interference analyses.
- A new step, described in a new section of the methodology called "Determining Transmitter Configuration," considers the transmitter configuration to be used in each interference study. It includes two characteristics of systems: terrain blockage and the method of sharing of channels and subchannels by the response stations.
- Terrain blockage between grid points and locations within neighboring systems is used to eliminate grid points from the interference analyses. This can be done in either of two ways. First, if a grid point has no line-of-sight to any point in the neighboring system (assuming

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<sup>152/</sup> As such, it responds to concerns expressed by EDX Engineering, Inc. ("EDX") that because the proposed methodology did not establish a unique set of grid points, analyses could not be readily replicated by other engineers. See EDX Comments, at 3-5.

the maximum antenna height used by each class of response station assigned to it), it can be eliminated from all the calculations of interference to that system. Alternatively, the presence of line-of-sight can be determined for the path from each grid point and class combination in the RSA to each location analyzed in the neighboring system. These changes may simplify the number of calculations required in many interference analyses and will allow additional flexibility in the manner of conducting some of the analyses.

- The methods for assigning power levels to grid points and for aggregating the power levels to be used in interference analyses have been modified to take into account the two fundamental ways in which response stations can share channels. If they take turns using the channel (as when a TDMA control protocol is employed) then only one response station can be active at a time on a particular channel or subchannel within a sector. In this instance, the grid point causing the worst case interference is selected for each sector and the power aggregated.<sup>153/</sup> The methodology has also been modified so that for systems where response stations will be taking turns using a given frequency (as in a TDMA system), it will not be necessary for the applicant to establish regions in order to comport with the uniformity requirements forced by the zip code analysis. Instead, all interference analyses can be conducted using the worst case response station characteristics associated with each grid point, simplifying the interference analysis regime. If multiple response stations can be operated simultaneously and the receiver sorts them out (as is the case where CDMA is employed), then the original method of allocating stations to grid points and accumulating their power levels to be represented by the respective grid points is used.

A few of the commenting parties have suggested that they require additional information as to the manner in which the proposed procedures for conducting analyses of the potential for interference from response stations will be applied.<sup>154/</sup> In response to that request, the Petitioners are submitting as Exhibit 2 a document prepared by Hardin & Associates, Inc. which provides a step-by-

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<sup>153/</sup> As such, it responds to the point made by Spike Technology, Inc. ("Spike") that where a Time Division Multiple Access control protocol is used, only one response station will be operating in each sector at a time on any given frequency. *See* Spike Comments, at 6-7.

<sup>154/</sup> *See* Dallas Comments, at 9. Maryland demands that "the Commission must also develop an adequate, standard software program to be used in the conduct of the more complex and extensive interference studies that would be necessary in the proposed new digital, cellularized, two-way environment." Maryland Comments, at 3. As Exhibit 2 demonstrates, however, there is no need for the development of new software, just an understanding of how existing software packages can be employed to perform the new types of studies.

step description of how an engineer can employ software products that are already readily available in the marketplace to perform analyses of the potential for interference from response stations. This document, coupled with the revised methodology and the materials previously submitted by the Petitioners, should provide all of the explanation that is necessary for an engineer to conduct his or her own analyses.

2. *There Is No Need To Abandon The Use Of Census Data For Determining The Uniformity Of Regions.*

Although the accompanying revision of the methodology addresses many of the concerns expressed in the comments, there are some that do not merit a reworking of the methodology. CTN and Spike, for example, suggest that the methodology is flawed by virtue of the fact that the test for uniformity of population densities is based upon U.S. Census Bureau data that reflects residential, not business, populations.<sup>155/</sup> While they are correct, neither CTN nor Spike appears to appreciate the practical implications of this factor. As the Petitioners have previously explained, the use of residential data, without any adjustment for business use, will result in the creation of additional regions within response service areas in order to meet the uniformity of population test required by the methodology.<sup>156/</sup> Although additional regions tend to reduce somewhat the flexibility afforded response hub licensees in the location of response stations, the more regions that are created, the more accurate predictions of interference tend to be. Thus, contrary to what CTN appears to suggest,

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<sup>155/</sup> See CTN Comments, at 20; Spike Comments, at 6.

<sup>156/</sup> See Petitioners' PN Reply Comments, at 43-44 n. 86.

the reliance solely on residential data will result in more accurate interference predictions, not more interference.<sup>157/</sup>

3. *The Commission Should Reject Spike's Proposal The Applicants Have Carte Blanche In Selecting Interference Prediction Methodologies.*

Given the comments supporting the use of a consistent methodology for the prediction of the potential for interference from response stations, the Petitioners urge the Commission to reject a proposal advanced by Spike that would allow applicants *carte blanche* in the manner in which they conduct the interference studies that must accompany an application for a response station hub.<sup>158/</sup> Spike provides absolutely no explanation as to how the public interest would be served by allowing applicants to depart from a standard methodology for predicting interference from response stations, and the Petitioners are at a loss to find one. To the contrary, the use of a standard model for predicting interference will provide a high degree of certainty to applicants and licensees and will avoid unnecessary disputes before the Commission regarding the efficacy of any particular model.<sup>159/</sup>

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<sup>157/</sup> CTN also suggests that the interference prediction methodology is flawed because there is no procedures for ensuring that response stations are constructed in the manner proposed by the applicant. *See* CTN Comments, at 20. Of course, it is always the case that the Commission relies upon licensees to construct facilities in accordance with their authorizations and does not independently verify proper construction on a routine basis. The Petitioners have proposed that response hub authorizations be specifically conditioned upon operation in accordance with the underlying application, and the Commission can rely upon licensees to abide by those conditions. *See* Petition, Exhibit B, at 19-20, 21, 50 (proposed Sections 21.909(f) and (i) and 74.939(e)). Of course, where it is determined that a response station hub authorization holder has improperly constructed or operated response stations, the Commission has a variety of tools for remedying the situation, including revocation of the response station hub authorization.

<sup>158/</sup> *See* Spike Comments, at 7.

<sup>159/</sup> Of course, the Commission should permit neighboring applicants and licensees to enter into voluntary arrangements to govern interference that employ other formulas for determining what facilities will and will not be acceptable. *See, e.g., Amendment of the Commission's Rules to*

The use of a common methodology for the predicting of potential interference from the issuance of a block authorization for response stations will significantly reduce the burden of reviewing applications for response station hub authorizations that would otherwise be imposed upon neighboring licensees. With a Commission-mandated common methodology, a neighboring licensee need only ascertain that the mathematical calculations were performed correctly. Absent a Commission-mandated common methodology, however, the neighboring licensee will not only want to validate the math, but will also be required to delve into the logical underpinnings of the methodology to determine whether it yields an accurate prediction of potential interference. Given the concern expressed by the ITFS community in particular that the application processing system deployed by the Commission should minimize burdens on ITFS licensees where possible,<sup>160/</sup> the benefits of a standard methodology are patent.

Moreover, the use of a standard methodology has the benefit of expediting service to the public and conserving Commission resources by minimizing the number of disputes that will require staff intervention. To the extent the only issue open for debate is whether the mathematics were performed correctly, there should be relatively few instances in which a petition to deny is filed against an application to add a response station hub. If, however, the accuracy of the underlying methodology as a predictor also is open for debate with respect to an application, a dramatic increase

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*Establish New Personal Communications Services*, 8 FCC Rcd 7700, 7763 n. 118 (1993)[hereinafter cited as “*PCS Second Report and Order*”]; 9 FCC Rcd 4957, 5030 n. 294 (1994)[hereinafter cited as “*PCS Reconsideration Order*”]. See also Petitioners Comments, at 31-33.

<sup>160/</sup> See, e.g., CPB Comments, at 10-15; P&C ITFS Comments, at 2; San Francisco/San Jose Consortium Comments, at 7, 12 - 18; Dallas Comments, at 4, (*incorporating by reference* Joint Comments of Dallas County Community College, *et al.*, RM-9060, at 6-9 (filed May 14, 1997)).